

Sustainability Roadmap 2018-2019: Energy

Progress Report and Plan Update
on Meeting the Governor's Sustainability Goals
for State Departments

California Conservation Corps

Edmund G. Brown Jr., Governor

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California Conservation Corps Sustainability Roadmap 2018-2019: Energy

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Acronyms

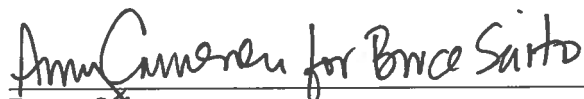
ADR	Automated Demand Response
CA	California
CALGREEN	California Green Building Code (Title 24, Part 11)
CEC	California Energy Commission
DGS	Department of General Services
EMS	Energy Management System (a.k.a., EMCS)
EMCS	Energy Management Control System (a.k.a., EMS)
EO	Executive Order
EPP	Environmentally Preferable Purchasing
EUI	Energy Use Intensity (source kBTU/sq. ft.)
EVSE	Electric Vehicle Supply Equipment (charging equipment)
GHGe	Greenhouse Gas Emissions
IEQ	Indoor Environmental Quality
kBTU	Thousand British Thermal Units (unit of energy)
LEED	Leadership in Energy and Environmental Design
MM	Management Memo
OBF	On-Bill Financing
PPA	Power Purchase Agreement
PUE	Power Usage Effectiveness
SAM	State Administrative Manual
SCM	State Contracting Manual
ZEV	Zero Emission Vehicle
ZNE	Zero Net Energy

EXECUTIVE SUMMARY

The California Conservation Corps (CCC) is comprised of young adults, ages 18 to 25 (and veterans to age 29), who work on conservation projects on public lands in cities and rural areas. Projects range from restoring fish and wildlife habitat, to installing energy and water-efficient improvements, building trails, and improving forest health. As one of the state's emergency work forces, the CCC responds to fires, floods, pest infestations, earthquakes and oil spills.

The CCC currently owns and leases 26 facilities in urban and rural areas - statewide, including eight residential facilities, 18 non-residential facilities comprising approximately 590,000 square feet of building space. The CCC has about 1,434 full-time corpsmembers, of which approximately 584 are housed in residential centers. A typical residential facility includes dormitories, administration, educational, recreational, warehouse, dining, and kitchen space and house 80 to 100 corpsmembers. Residential facilities operate 24 hours a day, seven days a week. The non-residential facility includes educational and administrative space which serves from 30 to 60 corpsmembers and operates five days a week.

The CCC has made significant first steps in meeting the goals of the Executive Orders by implementing procurement strategies, participating in the Governor's Office Sustainable Building Work Group (SBWG), timely reporting base year and ongoing monitoring of energy, gas, water and greenhouse gas (GHG) emissions as required, and implementation of water and energy saving projects at CCC owned facilities. We have completed water use audits at each residential facility and have implemented reduction measures. We have completed some energy audits, and will complete the remainder of energy audits at all CCC owned facilities in the 2017-18 fiscal year. Our Camarillo and Tahoe Centers are LEED "Silver" certified facilities. Camarillo is also on the DGS bid list for Zero Net Energy (ZNE). Upon completion of Delta Center in early 2018, it too will be listed for a PPA. Upon completion of Placer Center Dormitory and Multipurpose buildings, they will be ZNE facility utilizing photovoltaic panels and solar water heating. It is the goal of the CCC to meet the Governor's Executive Order B-18-12.


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SUSTAINABILITY GOALS

The Governor has directed California State Agencies to demonstrate sustainable operations and to lead the way by implementing sustainability policies set by the state. Sustainability includes the following general initiatives:

- Greenhouse Gas Emissions Reductions
- Building Energy Efficiency and Conservation
- Indoor Environmental Quality (IEQ)
- Water Efficiency and Conservation
- Monitoring Based Building Commissioning (MBCx)
- Environmentally Preferable Purchasing (EPP)
- Financing for Sustainability
- Zero Emission Vehicle (ZEV) Fleet Purchases
- Electric Vehicle Charging Infrastructure
- Monitoring and Executive Oversight

The Governor has issued numerous executive orders directing sustainable state operations. The orders relevant to energy are:

Executive Order B-18-12

EO B-18-12 and the companion *Green Building Action Plan* require state agencies to reduce the environmental impacts of state operations by reducing greenhouse gas emissions, managing energy and water use, improving indoor air quality, generating onsite renewable energy when feasible, implementing environmentally preferable purchasing, and developing the infrastructure for electric vehicle charging stations at state facilities. The Green Building Action Plan also established two oversight groups, the staff level Sustainability Working Group and the executive level Sustainability Task Force, to ensure these measures are met.

Executive Order B-16-12

EO B-16-12 required all State entities under the Governor's direction and control to support and facilitate the rapid commercialization of zero-emissions vehicles. Specifically, state agencies are to increase the number of its zero-emissions vehicles, through the normal course of fleet replacement, so that at least 10 percent of fleet purchase of light-duty vehicles be zero-emission by 2015 and at least 25 percent by 2020.

Executive Order B-30-15

EO B-30-15 declared climate change to be a threat to the well-being, public health, natural resources, economy, and environment of California. It established a new interim statewide greenhouse gas emission reduction target of 40 percent below 1990 levels by 2030, and reaffirms California's intent to reduce greenhouse gas emissions by 80 percent below 1990

levels by 2050. To support these goals, this order requires numerous state agencies to develop plans and programs to reduce emissions.

State Administrative Manual & Management Memos

The following sections of the State Administrative Manual (SAM), and associated Management Memos (MM), currently impose sustainability requirements on the Department under the Governor's executive authority:

- SAM Chapter 1800: Energy and Sustainability – This SAM chapter provides the policies and guidelines put in place pursuant to the *Green Building Action Plan* accompanying Executive Order B-18-12.
- MM 15-06: State Buildings and Grounds Maintenance and Operation - This management memo provides state building and facility managers with practices and procedures that will help them achieve operational efficiencies and resource conservation measures for: integrated pest management (IPM), drought moratorium, landscaping practices, maintenance of building exteriors, roofs, hardscape, and exterior painting.
- MM 15-04: Energy Use Reduction for New, Existing, and Leased Buildings - This management memo provides direction to all state agencies to reduce and to report energy use in: new building design and construction, major alterations and additions (new buildings and renovations), existing state-owned buildings (existing buildings) and new and renegotiated state building leases (building leases).
- MM 15-03: Minimum Fuel Economy Standards Policy - This management memo announces a revision to SAM section 3620.1 which sets a fuel economy standard for passenger vehicles and light duty trucks [under 8,500 pounds gross vehicle weight rating (GVWR)] that are purchased on behalf of, or by, state offices, agencies and departments.
- MM 14-02: Water Efficiency and Conservation - This management memo provides direction to all state agencies under the Governor's executive authority on meeting the water use reduction requirements. State agencies shall reduce water use at their facilities by 10 percent by 2015, and 20 percent by 2020, as measured against a 2010 (or earlier) baseline.
- MM 14-05: Indoor Environmental Quality: New, Renovated, And Existing Buildings - This management memo announces policy and provides direction to state agencies that build, lease and operate state buildings, on reducing indoor pollutant levels and ensuring healthy indoor environments for occupants in new, renovated, leased, and existing state buildings.
- MM 14-07: Standard Operating Procedures for Energy Management in State Buildings - This management memo amends the Standard Operating Efficiency Procedures regarding efficient energy management in state buildings during normal operations.
- MM 14-09: Energy Efficiency in Data Centers and Server Rooms - This management memo provides direction to all state agencies to meet data center and server room energy efficiencies.

ENERGY REPORT

This Energy Report demonstrates to the Governor and the public the progress the Department has made toward meeting the Governor's sustainability goals related to energy. This report identifies successful accomplishments, ongoing efforts, and outstanding challenges.

Department Mission and Built Infrastructure

Modeled after the Civilian Conservation Corps of the 1930's, the California Conservation Corps (CCC) is comprised of young adults ages 18 to 25 (and veterans up to age 29) working on conservation projects on public lands in cities and rural areas. Through their service, corpsmembers gain work experience, advance their education and learn about careers while helping to enhance California's natural resources and its communities. Corpsmembers complete more than 2,000 conservation projects annually, ranging from restoring fish and wildlife habitat to installing energy and water-efficient improvements, building trails, and improving forest health. As one of the state's emergency work forces, the CCC responds to fires, floods, pest infestations, earthquakes and oil spills.

The CCC currently owns and leases 26 facilities in urban and rural areas statewide, including eight residential facilities, 18 non-residential facilities, and several seasonal backcountry locations comprising approximately 487,000 square feet of building space. The CCC also develops and provides partial funding for 14 local conservation corps in neighborhoods through the state. The typical residential facility consists of approximately 50,000 square feet and includes a dormitory, educational, dining and kitchen, administration, recreational, and warehouse space. The residential facilities house from 80 to 100 corpsmembers and operate 24 hours a day, seven days a week. The non-residential facility generally includes administrative, educational and warehouse space. Non-residential centers typically serve from 30 to 60 corpsmembers, operate about 12 hours per day, five days a week, and are approximately 10,000 square feet.

Table 1: Total Purchased Energy 2016

Purchased Utility	Quantity	Cost (\$)*
Electricity	1,107,600 kWh	n/a
Natural Gas	25,106 Therms	n/a
Propane	20,850 Gallons	n/a
TOTAL COST	---	n/a

*Costs are not collected in EnergySTAR, as usage, not dollars, that determines greenhouse gas emission.

Table 2: Properties with Largest Energy Consumption

Building Name	Floor Area (ft²)	Site Energy (kBTU)	Source EUI (kBTU/ft²-yr)
Tahoe Center	51,584	6,080,931	117.8
Camarillo Center	49,800	5,335,595	107.1
Placer Center	44,500	4,349,463	97.7
Total for Buildings in This Table	145,884	15,765,989	---
Total for All Department Buildings	348,474	N/A	---
% of Totals	41.9 %	N/A	---

As with other departments, the challenges facing this Department in meeting the Governor's goals are as follows.

- **Short Staffing:** Since the inception of the first Sustainability Roadmap, the CCC has only one full-time facilities staff person located at its headquarters - a Departmental Construction and Maintenance Supervisor, designated to handle capital outlay projects, deferred maintenance, preventive maintenance, emergency repairs and other associated work. The responsibility of sustainability was added to an already very 'full plate'. In addition, the department currently does not have enough maintenance mechanics to properly maintain its eight residential centers. The Building Owners and Managers Association recommends a maintenance mechanic for each center - the CCC has only three for 26 centers located statewide. Maintenance mechanics are key facility personnel in ensuring that planned road map initiatives are carried out at CCC centers and satellite facilities. Recently, two retired annuitants (part-time) have been hired to assist in facility management and with the large amount of sustainability workload.
- **Insufficient Funding:** The CCC has a long history of making due with little, and over the last many years, a very large backlog of deferred maintenance projects have accumulated. Over the last several years the CCC has focused on reducing the backlog of deferred maintenance at centers and satellites, funding the top priority projects to preserve the safety of staff, corpsmembers and protect state assets. In recent years Department of Finance has provided funding for our deferred maintenance backlog as well. In 2016-17 the CCC received \$700,000 in deferred maintenance funding. The department has identified a total need of about \$4.0 million in the Governor's 2018/19 Five-Year Infrastructure Plan; however, no funding has been provided. The difficult choice has been, when funding becomes available, is deciding to spend the dollars on sustainability projects or invest in our facilities in order to provide basic maintenance?
- **Little Time:** Being short staffed with a large backlog of deferred maintenance projects, coupled with the Governor's reinstatement plan for the CCC residential program, which means requesting new facilities and managing new capital outlay projects, leaves little time to devote facility personnel to fully implement a sustainability plan. To date, the CCC has requested for a new Associate Construction Analyst position for headquarters and several Maintenance Mechanics positions in the field, which are included in the Governor's Proposed Budget for 2018/19.

Although the challenges are great, there has been some success at our state-owned facilities in managing, and in some cases, lowering our energy and water usage, reducing greenhouse gas emissions, and increasing the number of ZEVs in our fleet.

The Governor's green building website contains a graph with the CCC showing an 80 percent deficit for the "Percent Change in Grid Energy Usage". The graph does not tell the whole story of our efforts. For example, the graph covers a 13-year period from 2003 to 2016. In 2003, the base year, the CCC only had one state-owned residential center (the Placer Center). Within the span of 13 years, the CCC has grown by two new residential centers - Camarillo and Tahoe Centers. Thus resulting in a 200 percent residential center facility increase, and with that came a 184 percent energy use increase from 2003 as compared to 2016. This program growth is also reflected in higher water consumption and greenhouse gas emissions. As we continue to expand our program, with the new Stockton 'Delta Center' being completed in early 2018, the acquisition of our Fortuna Center in 2018, and the renovation and expansion of the Placer Center by 2021, all categories of energy use and GHG emissions will reflect increases due to program growth, expansion of facilities, an increased use of sophisticated facility and program maintenance and operations equipment, and zero emission vehicle charging stations.

Zero Net Energy (ZNE)

The Governor has set forth the following milestones for state zero net energy buildings:

2020 - 50% of new construction & major renovations will be ZNE

2025 - 100% of new construction & major renovations will be ZNE

2025 - 50% of total existing building area will be ZNE

Currently the Department does not have any completed ZNE projects due to the timing of the proclamation of the Governor's goals and the aforementioned projects that were already under way at the time (Camarillo, Tahoe and Delta Centers). In Camarillo's case, the Department is working with DGS to acquire a Power Purchase Agreement (PPA) for the center and is currently on the list for group bidding later in 2017-18. Due to heavy snow loads, Tahoe is not a viable candidate for the PPA program or an owned photovoltaic (PV) array. Delta, like Camarillo, will be included in a PPA agreement following the completion of construction, estimated for early 2018.

Regarding ZNE projects in the planning stages, Placer Center's phase I project is to be completed in 2021, which includes a new 50 kW ground mounted PV array and solar hot water heating systems for the new men's and women's dorms and multi-purpose building (kitchen, dining room and gym). The soon-to-be proposed phase II, will continue the replacement of the remaining facilities of the Placer campus and include an additional PV array to complete the center's ZNE goals. All future projects for the CCC include a PV array as a component of the

budget package, however due to budget pressures, the CCC may need to explore other less costly avenues toward ZNE (such as green power purchase agreements) when possible.

As compared to the Governor's ZNE goals above, the CCC has exceeded the first two goals by committing to 100 percent of new construction and major renovation will be ZNE. The projects are Placer and Delta Centers. By the end of FY 2018-19, the CCC will have exceeded the goal of 50 percent of existing state-owned buildings being ZNE.

Table 3: Zero Net Energy Buildings

Status of ZNE Buildings	Number of Buildings	Floor Area (ft ²)
Under Construction or Completed	1	50,608
Building In Design	1	31,000
Building Proposed for Before 2025 (but not yet in design)	14	640,000
Totals for ZNE Buildings	16	721,608
Totals for All Department Buildings	22	842,928
% ZNE	73%	86%

New Construction Exceeds Title 24 by 15%

All new state buildings and major renovations beginning design after July 1, 2012, must exceed the current California Code of Regulations (CCR) Title 24 energy requirements by 15 percent or more.

The CCC has one new facility (the Stockton Delta Center) under construction, which is due to be completed by early 2018. It was designed prior to the requirement of exceeding current (2010) Title 24 by 15 percent. Our second project, currently in the design phase, is Placer's new multi-purpose building and dormitory. It is being designed to the 2016 Title 24 - which exceeds the 2010 Title 24 requirements (effective July 2012) by more than 15 percent. The 2013 Title 24 requirements are 25 percent more efficient than the 2010 Title 24, and the 2016 Title 24 requirements are 28 percent more efficient than the 2013 Title 24 requirements.

The Department's Five Year Capital Outlay Infrastructure Plan for all newly proposed projects to be built through 2025, will all be designed and constructed for the Title 24 requirements effective at the time - 2019 Title 24, 2022 Title 24 and 2025 Title 24 respectively.

Table 4: New Construction Exceeding Title 24 by 15%

Buildings Exceeding Title 24 by 15%	Number of Buildings	Floor Area (ft ²)
Completed Since July 2012	0	0
Under Design or Construction	2	81,608
Proposed Before 2025	14	640,000

The Department partners with DGS for the design and construction management for all capital outlay projects. The architectural and engineering team (A&E) are required to design per applicable codes at the time. There are over a dozen codes they must comply with, including

the California Energy Code, Title 24. The codes are listed in the budget package, the Basis of Design (BOD) and are noted accordingly on the working drawings – all easily searchable by the Department to ensure compliance.

Reduce Grid-Based Energy Purchased by 20% by 2018

Executive Order B-18-12 requires state agencies to reduce grid-based energy purchased by 20 percent by 2018, compared with a 2003 baseline.

The CCC only had one state-owned property in 2003 - Placer Center. The baseline energy usage for this one facility in 2003 was 319,415 kWh. For 2016 the energy usage for Placer was 256,279 kWh which reflects nearly 20 percent reduction – exceeding the Governor’s goals. However, two other CCC facilities were built after establishing the 2003 baseline, Camarillo Center in 2011 and Tahoe Center in 2012, which had a negative impact when comparing current year to base year energy, water usage and GHG generation.

The CCC’s explanation regarding not meeting the Governor’s energy, water and GHGE goals is that we are meeting his other goals - reinstatement the CCC residential program. Although the CCC has not met the goals, we are in the working drawing phase for plans to replace selected buildings at the Placer Residential Center which will increase the net square feet of the campus. We are adding the new Delta Residential Center by 2018, acquiring the Fortuna Residential Center in 2018, with plans to add several larger CCC campuses which will further increase energy and water use, GHGE generation due to planned program growth, and include new energy management control systems. This goal of program reinstatement does not exempt the CCC from participating in sustainability practices; rather, we suggest adjusting the baseline accordingly in order to identify and quantify the results of our efforts.

There are numerous Management Memos and sections of the State Administrative Manual (SAM) that provide specific directions and support for this goal, including, but not limited to, the following:

- The Department of Technology’s Basic Policy 4819.31, item 13:
 - *“13. Agencies/state entities shall implement power management practices on all desktop and laptop computing devices, thin client devices, printers, copiers, scanners, and monitors. During hours of normal operation, devices which are not in use for 30 minutes shall automatically go into an energy-saving mode. Devices shall be shut down at the end of the normal business day.”*
 - 95 percent of the CCC’s devices go into energy saving mode after 15 minutes.
 - The CCC uses group policies for power management on computing devices, including desktops, laptops and monitors.
- Management Memo 14-07 “Standard Operating Procedures for Energy Management in State Buildings” and the associated Standard Operating Procedures:
 - Ensuring all lights and equipment are turned off at the end of each work day.

- The CCC ensures this is happening by issuing memos department wide, then follow-up by Regional Deputy Directors with field District Directors ensuring the policies are followed.
- The degree of successful implementation is measured and reflected in utility usage data, but also counter-balanced with the CCC's programs fluctuation and corpsmember population.
- At both headquarters and our field offices, employee engagement efforts are accomplished during staff meetings, distribution of emailed memos and the department's Standard Operating Procedures (SOP) manual.
- All computers, copiers and printers are set to utilize Energy Saver mode during periods of inactivity.
- Energy Star rated equipment is purchased whenever practical.
 - The steps the CCC takes to ensure that Energy Star equipment is being purchased when available is to review all purchase orders for such compliance. Scopes of work (SOW) are also reviewed for applicable requirements prior to bid.
- Lighting and HVAC electric usage is minimized outside of normal building hours.
 - The CCC ensures that buildings are thoroughly shut down outside of normal operating hours by providing written policy and making it the responsibility of the last occupants leaving the building to ensure that lighting and power consuming systems (such as HVAC) are shut down. If it is found that lighting or other systems were left on from the prior day, follow-up is made with those respective individuals by reviewing departmental policy with them.
- Building HVAC controls are set to allow for a +2 or -2 degree fluctuation from the temperature set point.
 - This currently is implemented on every thermostat throughout the CCC's building portfolio. Lockable covers have been installed with access controlled by staff responsible to ensure building compliance. Continual monitoring is required by staff to ensure that security systems are not by-passed.
- Ensure that buildings take advantage of cool nighttime and morning temperatures by effectively utilizing economizer and night flush cycles.
 - Very few facilities in the CCC's portfolio have HVAC units equipped with economizers. Of those that do, it is programmed into the system.
 - Building night flush cycles occur when the outside temperature is lower than the buildings inside temperature. This provides pre-cooling of the buildings just prior to occupancy the next business day.

- The challenges the CCC has encountered in implementing this procedure, includes lack of qualified maintenance mechanics positions in our field offices to implement or maintain these procedures.
- The IT division is responsible to ensure that data centers are operated at the maximum temperature allowed by equipment manufacturer's specifications.
 - In field, headquarters and at the CCC's headquarters, the temperature range is maintained between 73 and 81 degrees.
- Ensure that domestic hot water systems are not set hotter than 105 degrees.
 - The CCC verifies these setting at all buildings state-wide during visits by our health and safety officer and/or by visits by the facilities group. Control settings are verified and temperature measurements are taken at faucets.
- Ensure that HVAC ducts, filters and equipment are inspected and maintained at maximum effectiveness.
 - For state-owned properties, HVAC maintenance contracts calls for quarterly filter changes along with preventive maintenance. Generally, for leased property, property management is responsible for their equipment.
 - The CCC continually monitors, inspects and follows-up to insure the highest level of compliance with required policies.
- Ensuring that lights are turned off in all unoccupied rooms.
 - As the CCC's budget allows, or by means of identifying other outside funding sources, installation of occupancy sensors is the CCC's goal. Meanwhile, employee engagement by means of issuing policy memos and follow-up by management is used to ensure compliance.
- Measure light levels and remove lamps or reduce wattage to provide appropriate light level for the activities in the work area affected and consider adding task lights in order to reduce overhead light levels.
 - The CCC has not yet engaged in measuring light levels or performed 'de-lamping' based on light level results.
 - Beginning in 2018 the Department plans to measure light levels in all facilities to prevent excessive lighting.
- Replace all incandescent light bulbs and any remaining magnetic fluorescent ballasts in fluorescent light fixtures.
 - A state-wide energy audit will identify if these lights are still present in any of the CCC's facilities. If found, a systematic replacement plan will be put in place.
- Install daylight controls on electric lights in any space over 10,000 ft² that has skylights or windows.

- The CCC is planning a state-wide energy audit of all facilities which will determine the need for daylight controls.
 - Currently the CCC does not have any facilities controlled by daylight sensors.
- Ensure that state employees do not plug in any personal devices other than cell phone and Tablet chargers and task lights, and that any personal space heaters, microwaves, refrigerators and coffee makers are removed from the workplace.
 - The CCC enforces policy regarding employees using personal heaters, or other personal devices, without written permission.
- Ensure that any new equipment purchased for employee kitchens and break rooms has an Energy Star rating. Strive to replace refrigerators manufactured prior to the year 2000 with more efficient models.
 - A link will be provided once a policy has been developed.
 - Since the state does not fund departmental refrigerators for employees often employees pool monies to purchase used refrigerators. Therefore, the percentage of refrigerators dated prior to 2000 would in all likelihood be quite high. The CCC's energy audit will determine to what extent older refrigerators exist in our state facilities.
 - Once an audit has been performed, the CCC can determine an appropriate and available funding source, and then plan a timeline to replace them.
 - The only barrier to overcome would be identifying a funding source to fund the refrigerator replacement plan.
- Ensure that all vending machines on-site are certified to Energy Star version 3.0, section 3(B) or are equipped with after-market occupancy sensor or sales based energy management hardware.
 - The CCC's planned energy audit will determine the total number of refrigerated and non-refrigerated vending machines in our building portfolio, and the percentage of each (refrigerated and non-refrigerated vending machines) that are Energy Star version 3.0 compliant or have after-market energy management hardware.
- The CCC will ensure that all coffee makers shut off automatically.
- The CCC will ensure that kitchen, break room, and lunch room equipment is cleaned regularly and maintained to optimize efficiency.
- The CCC will ensure that timers are installed on all equipment including paper shredders, lighted snack vending machines, and water coolers, so the equipment will be turned off automatically during non-working hours.
 - Following a CCC-wide energy audit, policy will be developed and distributed along with follow-up measure to ensure compliance.

- The CCC will establish an annual email from the CCC's Director to alert and educate all employees on the importance of minimizing electrical plug loads.
- Management Memo 14-09 "Energy Efficiency in Data Centers and Server Rooms":
 - All state owned and leased data centers and server rooms greater than 200 square feet must be operated within the ASHRAE-TC 9.9, Class A1-A4 guidelines, including operating at temperatures between 73 and 81 degrees Fahrenheit.
 - The CCC's IT group confirmed that all data and server rooms are operated at temperatures between 73 and 81 degrees.
 - All state-owned data centers over 1,000 square feet must report their power usage effectiveness (PUE) to the Department of Technology each year.
 - All state-owned data centers over 1,000 square feet with a PUE above 1.5 must reduce their PUE by a minimum of 10 percent per year until they achieve a PUE of 1.5 or lower.
 - The CCC does not have data centers sized over 1,000 square feet.
 - All purchases of network switches and routers meet the Energy Efficient Ethernet IEEE 802.3-2012 Section 6 standard.
 - Virtualization options must be considered when refreshing server equipment or standing up new systems.
 - The CCC's IT group assured compliance that all purchases meet the Energy Efficient Ethernet IEEE 802.3-2012 Section 6 standard.
 - The CCC's IT group assured that at least 98 percent of the CCC's servers are in the virtual environment.

In 2003, the Baseline Year, the Placer Center was the only state-owned facility on line, which is 44,500 square feet and used 3,422,239 kBTUs. In 2011, both Camarillo Center, at 49,800 square feet, and Tahoe Center, at 12,650 square feet were added. Next in 2013, Tahoe Center expansion/remodel, which started in 2012, was complete at 51,584 square feet, bringing the 2013 total square footage to 145,884 square feet of state-owned space.

Table 5: CCC Wide Energy Trends

Year	Floor Area (ft ²)	Total kBTU Consumption	CCC Average EUI
Baseline Year	44,500	3,422,239	76.9
2012	145,884	14,587,513	100
2013	145,884	14,684,481	100.7
2014	145,884	14,981,006	102.7
2015	145,884	15,892,490	109
2016	145,884	15,767,362	108
2018 Goal			

It is the goal of the CCC is to reduce grid-based energy use (kW) by 20 percent. However the CCC only had one owned facility during the established 2003 base year – Placer Center. Since that time the CCC has added two more centers, Camarillo and Tahoe, increasing the department’s total kBTUs rather than reducing it. In addition adding two new centers, which were LEED “Silver” certified, they increased our average EUI, to 108 in 2016, as compared to base year of 76.9.

All future CCC capital outlay projects going into the planning phase will include new energy management control systems; and where feasible, CCC will pursue solar power purchase agreements to ensure the CCC move towards compliance to reduce grid-based energy purchases. Although striving for full compliance, due to limited staff and funding resources, the CCC may not reach the target of 20 percent reduction (using the 2003 baseline year) by the year 2018, and may possibly reach the goal by 2019.

Table 6: Energy Reductions Achieved

Purchased Energy Compared to Baseline	Number of Buildings	Floor Area (ft²)	Current Year Energy Use	Percent of Total Energy
20% Reduction Achieved	1	44,500	256,279	20%
Less than 20% Reduction				
Unspecified Baseline (if any)				
Totals				20%
Department-Wide Reduction				

The CCC has not undertaken any major energy projects since the baseline year had been established; however, lighting retrofit projects have been completed at the Sacramento Regional Office and Fresno Center Classroom. The existing Camarillo Residential Center and new Delta Center will be the CCC’s first two Power Purchase Agreement (PPA) facility in 2018. Placer Center, which is in the design phase, will be the CCC’s first project that includes a state-owned photovoltaic array. This project is scheduled to be completed by 2021.

Table 7: Summary of Energy Projects Completed or In Progress

Year Funded	Energy Saved (kBTU/yr)	Floor Area Retrofit (ft²)	Percent of CCC Floor Area
2012	N/A	0	0
2013	N/A	0	0
2014	N/A	0	0
2015	N/A	0	0
2016	N/A	0	0

The CCC proposes to conduct state-wide energy audits of all of its facilities in 2018. To date none of the CCC’s facilities has undergone a prior energy audit.

Table 8: Energy Surveys

Year	Total Department Floor Area (ft ²)	Energy Surveys Under Way (ft ²)		Percent of CCC Floor Area (ft ²)	
		Level 1	Level 2	Level 1	Level 2
2012	0	0	0	0	0
2013	0	0	0	0	0
2014	0	0	0	0	0
2015	0	0	0	0	0
2016	0	0	0	0	0

With Executive Order B-18-12 the CCC started work on projects to reduce grid-based energy purchases. Again with lack of resources and funding, projects have been delayed and slow in development. In February 2017, the CCC centralized its energy project work and formed the Energy Region Unit. This new Energy Region Unit will help direct resources towards development of necessary energy projects for the CCC to reach targets and goals outlined in the Governor's Executive Order.

Demand Response

Executive Order B-18-12 directed all state Departments to participate in available demand response programs and to obtain financial incentives for reducing peak electrical loads when called upon, to the maximum extent cost-effective.

In response to the Executive Order, the CCC participates in the voluntary load reduction program of the California Independent System Operator (CAISO) - the Flex Alert program. Upon receipt of an alert, specific actions take place such as adjusting the thermostat up to 78 degrees, turning off unnecessary lights, using energy saving measures, and if possible, avoid using office equipment.

Since most of our field locations are situated in rural and remote areas of the state, near the resources we work to preserve and protect, few locations are called upon during the summer months to reduce energy consumption. Primarily, Flex Alerts occur in urban areas of the state - such as the CCC's headquarters in Sacramento where it has been rare.

The CCC will also coordinate with respective utilities for participation in programs such as Peak Day Pricing, Base Interruptible Program, Scheduled Load Reduction Program, Load Shifting, and possible Optional Binding Mandatory Curtailment Plans.

Table 9: Demand Response

Demand Response Participation	Number of Buildings/Sites	Estimated Available Energy Reduction (kW)
Number of Buildings Participating in 2016	0	n/a
Number of Buildings That Will Participate in 2017	26	n/a
All Department Buildings (Totals)	26	n/a
All Department Buildings (Percent)	100%	n/a

Renewable Energy

New or major renovated state buildings over 10,000 square feet must use clean, on-site power generation, and clean back-up power supplies, if economically feasible. Facilities with available open land must consider large scale distributed generation through various financing methods, including, but not limited to, third party power purchase agreements (PPAs).

Although there are no specific kW goals for renewable energy, renewable energy does count towards meeting: (1) Zero Net Energy goal for 2025 and; (2) 20 percent grid based energy use reduction by 2018.

The CCC does not currently have any on-site renewable energy production. We do, however, have projects in the planning and future development stages that include local renewable energy generation. Among the renewable energy options considered are solar photovoltaic (PV), solar thermal, wind, hydro, biomass and geothermal, to name a few. From these, solar photovoltaic and thermal are the most compatible with our program. Our residential centers consist of about nine to 12 buildings, with only the warehouse buildings sized at just over 10,000 square feet. The CCC decided to count the “campus” facilities as one building – the total square footage of approximately 50,000 square feet, in determining the facilities required to meet the Governor’s sustainability goals.

Projects in the planning stages are Placer Center’s phase I project to be completed in 2020, which includes a new 50 kW ground mounted PV array and solar hot water heating systems. The project is to replace the men’s and women’s dorms and mess hall with a new men’s and women’s dormitory and multi-purpose building (kitchen, dining room and gym). The soon-to-be proposed phase II, will continue the systematic replacement of the remaining buildings of the Placer campus. Phase II will also include an additional PV array to complete the center’s ZNE goals. All 12 future projects of the CCC will include renewable energy as a component of the budget package. This will help secure future funding from the Department of Finance (DOF) as well as inclusion in the design phase work by the Department of General Services.

Table 10: On-Site Renewable Energy

Status	Number of Sites	Capacity (kW)	Estimated Annual Power Generation (kWh)
Renewables In Operation or Construction	0	0	0
Renewables Proposed	13	unknown	unknown
Renewable Totals	13	n/a	n/a
Department Wide Totals	3	n/a	n/a
Department Wide Renewable Percent	433%	n/a	n/a

Monitoring Based Commissioning (MBCx)

New and existing state buildings must incorporate Monitoring Based Commissioning (MBCx) to support cost effective and energy efficient building operations, using an Energy Management Control System (EMCS). State agencies managing state-owned buildings must pursue MBCx for all facilities over 5,000 square feet with EUIs exceeding thresholds described in Management Memo 15-04.

The CCC owns three residential centers, Placer, Camarillo and Tahoe. Delta Center is currently under construction, due to be completed in early 2018 and will become our fourth state-owned property – it does not have an EMCS. Placer is in the working drawing stage and is the first of a two-phased center wide replacement project. It would not be prudent to expend funding in monitoring based commissioning of the existing center with construction slated to begin in the fall of 2018. The project does include an EMCS. Both Camarillo and Tahoe were designed and built to LEED “Silver” and are both candidates for recommissioning. The Fortuna residential center is on a lease to purchase property, originally built in 1992. We intend to exercise our option with the help of DGS by July 2018. Fortuna Center will become our fifth state-owned property.

The CCC does not have any experience with EMCS or MBCx and we lack qualified maintenance mechanics at nearly all owned and leased facilities, which is required to operate such systems. Any planned EMCS and/or MBCx would be predicated on having a qualified facility staff on-site to oversee and operate the system. We anticipate additional onsite facility staff in the future. We foresee the Maintenance Mechanic to review EMCS data, trend data and identify and solve problems; and funding for facility studies, design, procure and implement of MBCx system including pertinent hardware and software, and staff training.

Table 11: Planned MBCx Projects

Building	Location	Floor Area (ft²)	EMCS Exists? (MBCx Capable, MBCx Difficult, No EMCS)	MBCx Projected To Start	Projected Cost (\$)
Camarillo Ctr.	Camarillo	49,800	No EMCS	2019	\$200,000
Tahoe Center	S. Lake Tahoe	51,584	No EMCS	2020	\$210,000
Delta Center	Stockton	50,608	No EMCS	2021	\$221,000
Fortuna Center	Fortuna	27,656	No EMCS	2022	\$116,000
Totals		179,648			\$747,000

Financing

State agencies are required to pursue all available financing and project delivery mechanisms to achieve these goals including, but not limited to: state revolving loan funds, utility On-Bill Financing (OBF), Power Purchase Agreements (PPAs), GS \$Mart, Energy Service Contractors (ESCOs), or other available programs.

Due to challenges discussed earlier in this section, the CCC has not yet been in a position to identify medium to large sustainability projects for our existing state-owned properties. It is also the case that two of our state-owned centers are LEED “Silver” certified (Camarillo and Tahoe) and the third (Placer) will be rebuilt - possibly attaining LEED “Gold”. A fourth Delta Center, is currently under construction, has been designed to attain LEED “Silver”. The CCC has been successful in including ZNE in our budget packages for our future capital outlay projects, which would be bond funded or by general fund. The CCC has made advancement in low, or no cost, sustainability projects in the past and has recently begun to pursue Power Purchase Agreements for Camarillo, and will soon do so for the Delta Center. Over the next year or so the CCC will be perform energy audits and planning sustainability projects for which creative funding sources will be needed in order to see these projects come to fruition.

DEPARTMENT STAKEHOLDERS

Zero Net Energy (ZNE)	
Steven Fultz	Departmental Construction and Maintenance Supervisor, Facilities Unit
Ron Sanchez	Associate Business Management Analyst, Facilities Unit

New Construction Exceeds Title 24 by 15%	
Steven Fultz	Departmental Construction and Maintenance Supervisor, Facilities Unit

Reduce Grid-Based Energy Purchased by 20% by 2018	
Steven Fultz	Departmental Construction and Maintenance Supervisor, Facilities Unit
Ron Sanchez	Associate Business Management Analyst, Facilities Unit

Demand Response	
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Renewable Energy	
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Monitoring Based Commissioning (MBCx)	
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Financing	
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